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# UNITED STATES DEPARTMENT OF AGRICULTURE Bureau of Agricultural Economics Washington

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July 28, 1925

FOREIGN NEWS ON CITRUS FRUIT

# THE SPANISH ORANGE INDUSTRY

Spain is the principal source of oranges for all European markets, Regardless of the growing importance of such producers as Jaffa, South Africa and Australia, Spain on account of her proximity to the markets and her natural advantages for orange production will undoubtedly continue to be the controlling factor in European orange markets. In competitive production her groves probably would be the last to survive and her production to a large extent will set the price levels for the other countries dependent upon European markets as an outlet.

In looking into the field of possible outlets for American oranges in European markets, the competition of Spain has been given more attention than that of other countries for the reasons indicated above. The investigations made in the Spanish producing areas in securing these notes were intended to furnish reliable information as to what prices Spanish oranges might sell for in European markets and still assure an adequate supply. Other information given is merely incidental.

Like most agricultural production, the determining factor in governing the supply is how little the growers are willing to accept before they will change to some other crop or another occupation. The people in an old country like Spain are slower to change their methods and occupations than in a country like America, so it is practically a question there as to how little the orange grower may receive and still maintain an existence for himself and family.

# Production and Exports.

Oranges are grown all along the southern coast of Spain, but their commercial production is more or less concentrated in districts. Excepting Seville, which, from an export standpoint, is more heavily interested in growing bitter oranges used in marmalade manufacture, we find the commercial orange plantings within a distance of 220 miles, the most important northern section being Castellon and the most important southern one being Murcia. The city and district of Valencia occupies a central position and is to the orange industry of Spain what Los Angeles is to that of California.

At the present time Spain exports about 15,000,000 half-cases, weighing from 110 to 112 pounds each. Statistics furnished by the American Consulate in Madrid segregate production for 1923 as shown on the following page.

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District :	Number of Trees: Produ			ction			
		:					
		:	Weigh	<u>nt</u>	:	Value	2
a :		:			:		
Valencia	5,000,000	:	3,890,000	Qui.tals	:	62,240,000	Pesetas
Alcanto:	250,000	:	92,000	11	:	1,840,000	9.9
Castellon:	5,573,585	:	2,196,980	11	:	44,184,459	11
Murcia:	1,778,935	:	711.574	11	:	14,231,480	91
Granada	38,032	:	15,213	11	:	182,556	11
Malaga	•			##	•	2,273,267	11
Almeria:	•	:	276,300	11	:	3,675,550	11
Sovillo	•	:	456,779	11	:	5,481,558	11
Cordova	,	:	79,200	79		1,188,000	**
		-:-			•		
Total	13,885,994		7.875.370	95	. 1	35,296,706	11

Quintal= 220.46 lbs. Average value of Peseta in 1923 = 14.45 cts.

The following table adoption by United States Concul C. S. Edwards, of Valencia, Spain shows the area of distribution of Spanish oranges.

SHIPMENTS OF SPANISH ORANGES, DECEMBER 1, TO MAY 30, 1924 and 1925

Country of Destination :	1924-25 Secson	:	1923-24 Season
:	Cases	:	Cases
Belgium:	961,843	:	961,402
British Ports:	·	:	
Bristol:	366,936	:	<i>3</i> £3,758
Cardiff:	261,446	:	237,962
Glasgow:	410,731	:	394,038
Hull:	525,236	:	777,434
Liverpool:	1, 329,778	:	764,915 -
London:	1,849,708	:	1,650,982
Manchester	656,182	:	457,966
Newcastle:	180,857	:	203,173
Southempton:	259,821	:	147,131
Danzig:	26,164	:	47,000
Denmark:	106,533	:	164,982
France:	31,347	:	64,538
Gormany: :		:	
Bremen:	238,800	:	67,794
Hamburg:	2,003,023	:	1,203,639
Holland: :		:	
Amsterdam:	521,926	:	681,050
Rotterdam:	720,389	:	594,868
Iroland::	142,289	:	156,340
Norway:	193,412	:	130,100
Sweden: :		:	
Gottenborg:	36,325	:	47,312
Stockholm:	29,540	:	3,300
:		:	0.770.404
Total Cases:	10,962,386	:	9,119,684

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No mention is made as to the size of the cases, but much of the fruit shipped to the Scandinavian countries and some of that to the other markets is packed in full cases. It is to be noted that the shipments to Liverpool during 1923-24 were unusually light. Owing to a disagreement between shippers and importors this market was subject to a boycott for several weeks

Spanish orange groves are very small, most of the growers having from ten to fifteen hanegadas, - two to three acres, 4.865 hanegadas being equivalent to one English acre. The ownership of large tracts of erange groves in Spain is very unusual. In some sections the grower lives on his farm while in other sections he lives in the villages or towns and goes to and from his groves, frequently having a house on the place where his family spends the warm period of the summer menths.

The soil in the crange districts varies a great deal, but that observed in Castellon, Valencia and Murcia was mostly a clay loam with enough loam and gravel to enable the groves being flooded without apparent puddling or baking. The land adapted to growing oranges is not planted solidly to trees, much being used for rice, onions, grain crops, artichokes and some alfalfa. Although fertilizing is necessary, splendid crops of grain were being raised in fields adjacent to many of the groves. Most of the growers keep a horse, mule or burro and raise forage crops necessary for its upkeep.

The trees are planted from 16 to 20 feet apart and are kept pruned to low heads. At no point have trees been seen that even approach in size the Washington Navel and Valencia groves in California. From 500 to 1000 fruits per tree is considered an average yield, the size of the fruit averaging smaller than that grown in California and Florida during favorable years.

Many of the growers as well as the shipping industry do not have a close knowledge of varieties. For commercial purposes oranges are classed as "Whites", "Bloods" and "Blood Ovals", the seasons of which are in the order mentioned. Of the white eranges the Vernas Imperiales is possibly the most distinctive variety. It matures late in the season concurrent with the Blood Ovals and is a good shippor.

The quality of oranges grown in Spain may be reported upon favorably. While the Spanish crange is reputed to be tender and not too good a shipper, comparisons cannot be drawn between the shipping qualities of Spanish and American oranges because of the excessive and carcless handling given the Spanish fruit. The appearance of the Spanish oranges is not so good as California Navels or Valencias because they are not washed, but it is fully up to that of the average Florida fruit. With the exception of the Bloods and Blood Ovals, the average of Spanish oranges excels either Californias or Floridas in general eating quality when taken at proper stages of maturity. On the whole the fruit seems to combine California's good separating qualities and freeness from tough "rag" with Florida's thin skins and juiciness. As far as eating is cencerned the only point against Apanish fruit is the seed content, which is heavy in some strains.

The season of harvest, extends from October until June. Most of the oranges shipped before January 1st, however, are not ripe enough to have good eating quality. The heaviest shipments occur during January, February and March, tapering off in April, with comparatively light shipments during May and June.

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The price of orange land in Spain, as in other orchard districts, varies considerably with the season. After a profitable season like the past one, the grower seeks to invest his earnings in more orchard area and creates higher values. In a good preducing section, such as Castellon, orchards are worth 3,000 pesetas per henegada, or approximately \$2,000 per acre although such prices are taken as higher than in average years.

# Primitive Methods Still Provail.

Although the Spanish orange grower represents some of Spain's most substantial citizerry, he is mostly of peasant caste, out of touch with the world's agricultural development and goes about his work in a very primitive fashion. Much of the cultivating in the groves is done by hand with a heavy mattock, the ground being turned over during the winter after the rains. For the most part cultivating is done in patches so that all of one grove does not get theroughly cultivated at one time. Wherever cultivating is done by power, one animal is hitched to a crude crooked-stick tool, fitted with shafts which loosens the seil much in the same fashion as would be done in "plowing corn". A regular furrow is not turned. This method of cultivating is not often seen in the groves, however, as the trees are usually too low and too close together to make it possible to use an animal.

Up until about ten years age the only fertilizer used in the groves was the manure of animals kept by the grower on his farm. During the period of the war orange growing was so profitable that the growers made efforts to bring in additional production and purchased commercial fertilizer. At the present time nitrate of soda is imported from South America for use in the groves about Valencia. Shippers object very strenuously to the use of commercial fertilizer, however, as they claim that it has caused the quality of the Spanish crange, more especially its carrying quality, to be greatly lowered.

The uncertainty of rainfall makes irrigation necessary at all times during the year. Gravity irrigation is the most common method, some of the systems now in use having been in operation since their installation by the Moors between 1200 and 1500. Water is conducted through masoury flumes, a favored practice being to dyke off a given area of the grove and completely flood the soil without using ditches.

# The Spanish Orange Grower has a Cash Deal.

Unusual marketing methods are to be found in Spain. Although the grower may speculate as to the time of the year that he sells his crop, that is as far as he carries his speculations because he invariably sells his crop on the trees and the buyer makes a cash deposit at the time of purchase with the balance paid at the time the fruit is taken from the groves. The producer takes very little part in the harvesting and marketing as the buyer does the picking, hauling, packing and shipping.

Some growers sell their crops by the lump. By far the more common practice is for the oranges to be bought by the thousand fruits. This practice necessitates the county the fruit before it leaves the crchard, the operation being checked by both the grower and the packer in order that each may be certain that an honest count has been made.

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Following the various steps in the distribution of Spanish cranges we find first the local packer or buyer who has packinghouse facilities in the town with baskets, carts, horses, mules or burnes for hauling and a varying amount of credit with foreign expert brokers. Next come the expert brokers of Great Britain, Belgium, Holland, Germany and Denmark, the same people that handle the bulk of our American apple experts. Besides their auction facilities at home these factors maintain resident agents in Spain and finance the Spanish packer in the purchase of his fruit, boxes and paper and in handling his payroll, and also act as shipping agents in the Spanish ports.

The expert broker is the most important factor in the deal. Although nominally accepting consignments from the Spanish buyer his financial interest in the latter's operations gives him virtual control of shipments, so it follows that the brokers largely govern the flow of oranges to the various Northern European markets. Upon arrival the consignments are mostly sold at auction to the small lot buyers who look no farther than the port auctions for their regular supplies of imported fruits.

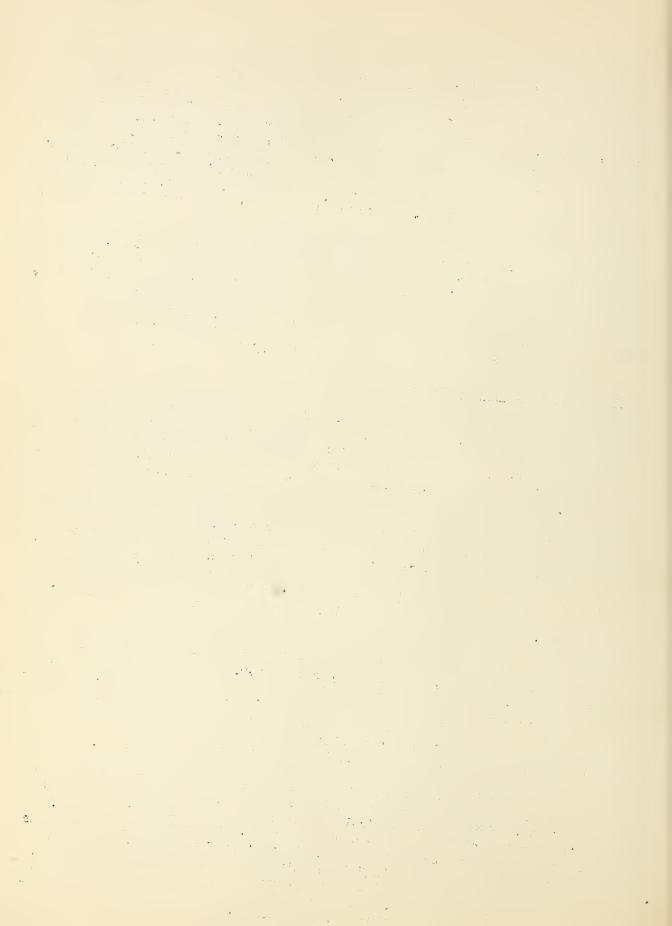
### Excessive Handling of Fruit.

In following the Spanish erange from the tree to the consumer the feature that most impresses the American observer is the great number of times that the fruit is handled and consequently its subjection to excessive risk from injury. There is no doubt but that there is a direct relation between this and the heavy loss from decay experienced during certain seasons.

The packer sends his men into the orchard and the cranges are clipped from the trees, usually with one cut. The picker uses a loosely woven basket that is suspended from the shoulder after the fashion of a bag. The fruit is piled on mats spread upon the ground in close proximity to the trees that are being picked. These piles or "mountains" are from two to three feet deep and are intentionally left in the orchards from three to four days.

From those "mountains" the fruit is picked out, counted and placed in flexible baskets by two of the packer's men, the packer and grower, or representatives of each keeping tally for the men as they count. Inother pair of men carry the baskets to the packer's two-wheeled cart, practically the sole vehicle used for hauling in Spain, and in this they are hauled to the packinghouse in an adjacent village or town. The cart has no springs and the roads are all unpaved and in many instances quite rough.

The packinghouse floors are covered with a layer of straw and upon this the fruit is dumped from the baskets in which they were hauled from the groves. Here again the fruit is held in "mountains" from 2½ to 3 feet depth, for a period of from 3 days to a week. The purpose given for thus holding the oranges prior to packing is that of "sweating". It is suspected that the process of "sweating" is nothing more nor less than shrinking, since the oranges are packed without pressure and it would seem essential to have as much shrinking as possible take place before packing in order that the packs would stay firm during transit.



# Simplicity of Packing Equipment.

A Spanish orange packing house is essentially a four-walled building with only straw on the floor and baskets as the equipment. Even the Boxes are more or less "custom made" with carpenters to dress the corners of the shook and cut the length when necessary. With this simplicity of equipment there is necessarily a much greater complement of labor than would be found in an American plant.

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As the fruit is picked up from the large piles in the packinghouse, the women sort it into three grades and place it in the same loosely woven, flexible baskets for a porter to carry and empty out in other piles according to grade. From these piles the oranges are again picked up by other crows of women who size the fruit and segregate the dirty orgages. The latter are then carried to women who accomplish the cleaning by scouring the eranges through a series of wet and dry sawdust baths. For fancy packs nearly all of the oranges are thus cleaned by hand.

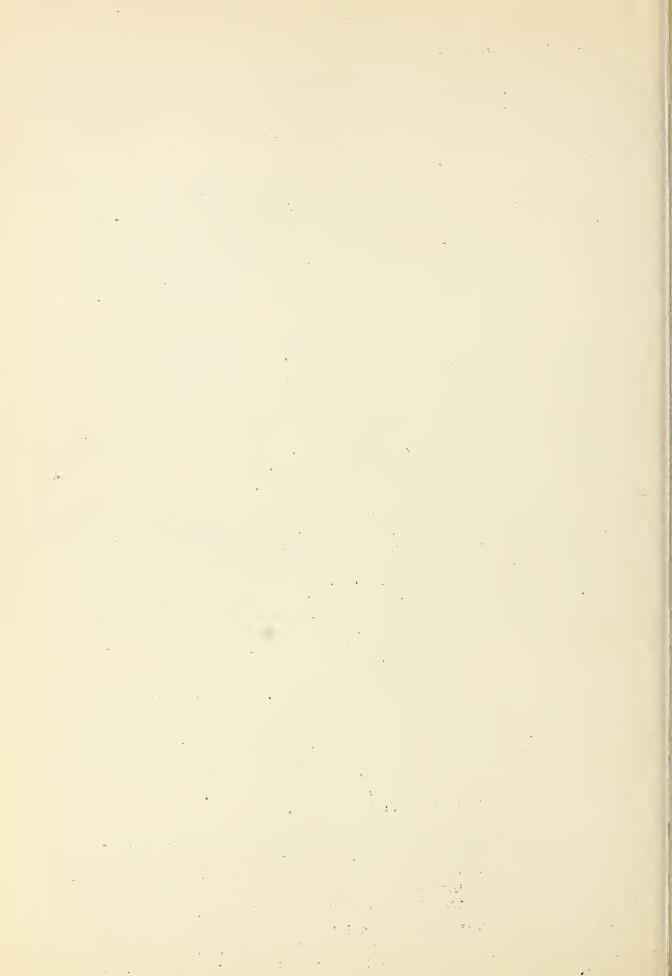
After being cleaned and sorted the baskets of oranges are carried to other groups of women who do the wrapping. Each orange is wrapped as carefully as if it were a piece of jevel ry, being placed in the tissue and given a spin in a manner that leaves the tissue tightly gripping the fruit with two "pigtails" to bind the wrap. After the fruit is wrapped it is thrown into baskets and carried to the packers. A tribute to the secure wrapping of Spanish oranges is to be seen in the splendid condition of the fruit in the Paris market where it arrives in bulk freight car shipments, with wraps still finally intact after the fruit has been removed from the cars and hauled to the market in crates.

Packing is done by two women at each case, the cases being placed on a paved section of the floor. First, a small girl removes the wrapped oranges from the baskets and places them in the sections of the case. Then the packers, beside the case on their knoes, deftly arrange the oranges in a square pack that is perfectly firm. To be able to look through the cracks of a case and see completely through the package of fruit between the rows of oranges is one indication of an excellent pack. Shippors place great importance on this manner of packing since it allows the air to circulate freely through the packed fruit and is supposed to be a great preventative of decay and deterioration.

No pressure is used in lidding the cases. The bulkheads of the case are crowned above the ends and the lidder nails the tops in place, saws off the overlapping ends of the shook, gives it a trim with a plane and proceeds to bind the case with the grass rope that is familiar to all those who have seen shipments of Moditerranean fruit. He makes certain that three strands of rope are securely around the case at its middle because it is upon this that the security of the whole package depends when being slung into and being discharged from the ship.

While the excessive handling and rough treatment of Spanish oranges unquestionably subjects them to greater transit losses from decay than is the case with American oranges, it is equally true that the Spanish package is much more secure than the boxes of either Florida or Colifornia. The cases are built to stand the rough treatment that they are to receive.

In handling fruit by ship it is essential that the boxes be more secure than is necessary in our demestic trade the United States, and American citaus shippers catering to the European trade should consider this matter seriously.



After packing is completed the fruit is immediately loaded into a two-wheeled cart and again given a rough ride to the port, providing a rail haul does not intervene. Owing to the fact that the bulkheads are crowned, at least partially removing the pressure of the bulge from the fruit no attention is paid to piling the packages on their sides or ends during this tedious springless ride.

The cases are dropped off the wharf to lighters by means of hand goar. The lighters are then rowed or towed out to the ship, where the ship's goar picks up from four to dix cases at a time by hooking directly into the grass ropes that are used to bind the cases. It should be noted that the packer, who is the buyer, stands all of the expenses of all of these operations from the time the fruit leaves the tree until it is alongside the ship on the lighter.

There are many indications that the packer's business is a very speculative one. Growers follow the orange prices in the principal markets and are quick to advance their selling prices as soon as there is a rise in the northern markets. The large brokers are very careful in following the packer's operations to see that he does not pay too high prices and to see that he is delivering packed boxes that correspond with his advances. In seasons of rising markets the packer's position is an easy one, but when there are great fluctuations or when the fruit does not carry well his lot is one of grief.

As the resources of many of the packers are limited, it is probable that some of their losses fall upon the brokers. This has induced some of the resident agents of the brokers to enter into a joint account with the packer, not only so that they may share his profits as well as his losses, but so that they may be more certain of holding their source of oranges one year after another.

A number of the Spanish packers maintain representatives in the principal northern markets. These men constitute for their employers a direct source of market information separate from that of the brokers; they appear at the docks at the time of discharge of cargoes and satisfy themselves that the fruit is classified preperly; they appear at the auction and represent the shippers' interests in case of necessity; and, finally, being resident agents, they usually got the advantage of "spot" terms of sale and handling. Owing to the fact that the Spanish shipper is being financed by brokers however, his market representative is not in an independent position and so cannot be as effective in protecting the shipper's interest as he could under different conditions.

# Pulk Shirmonts to France.

The above methods of marketing oranges find an exception in the case of French markets. Makeavy proportion of the eranges going to Paris and other French markets are wranged and loaded into freight cars that have previously been prepared by liming the floors and walls with a layer of straw. The wrapped fruit is transported from the packing house to the railway in the floxible baskets used in the packinghouse for carrying the fruit from the wrappers to the packers.

 Upon arrival in the French markets the commission merchant uses various containers for removal to the market. In Paris the most popular is the crate holding about 60 pounds of fruit. This use of different sized containers necessitates the French commission merchants selling by weight.

# The Cost of Production of Spanish Oranges.

It would be very difficult to determine how low the price of oranges would have to go before the Spanish grower would cease to furnish a supply to the markets of Northern Europe. It is probable, however, that the price would have to go far below the cost of production and stay there for many years because of the conditions under which the fruit is grown. The growers are peasants with small land holdings. They use family labor and their wants are extremely simple. They support no automobiles or radios and their homes are furnished with far less than that seen in the average American laborer's home. Practically the only call that they make upon organized industry is for a sewing machine in the house, for imported fertilizers, very simple clothing and a portion of their food supply.

The statement given by a British importer that 9 shillings (\$2.19) per half case (112 lbs.) f.a.s. Valencia, or 12 shillings (\$2.92) at auction in the British ports would insure a permanent supply of Spanish oranges, seems to be a conservative estimate, in the light of the writer's investigations in Spain.

# Growing Costs.

The following orchard costs were furnished by one who has lived in Valencia a great many years and whose position and relation to the industry should make them thoroughly reliable.

# Per Acre

Rent	<b>L</b> 12	Os.	(\$58.32)
Fertilizer	6	0	(29.16)
Plowing, weeding, hoeing	6	0	(29.16)
Irrigation	0	15_	(3.65)

Total..... <u>L</u> 24 15s (\$120.29)

Estimated production, 15,000 pounds or 150 cases per acre.

Cost per case of 100 pounds not, 3.3s (80¢) or 5.5 pesetas.

Cost per N. (1000 oranges), approximately 9.9s (\$2.40 or 16.6 pesotas).

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The statements made by most brokers were to the effect that after a grover received from 20 pesetas (\$2.90) to 22 pesetas (\$3.19) per thousand fruits on the tree he started to make profits. During the past season the price to the grower started out at 20 pesetas per thousand, and gradually increased until near the end of the season he was getting 80 pesetas (\$11.60) per thousand. In all shipping districts it was agreed that it had been a very prosperous year for the Spanish orange grover.

#### Packing Costs.

The British brokers as well as the Spanish packers universally stated that the cost of picking, packing and shipping a case of oranges during the current year was 7 pesetas (\$1.01). Itemized costs secured from packers seemed to substantiate this figure.

Labor costs were placed at 2 1/2 pesetas (36¢) per day for sorters and wipers; 4 pesetas (58¢) per day for wrappers; 8 pesetas (\$1.15) per day for packers; and 6 pesetas (85¢) to men and 3 pesetas (43¢) per day to women for picking.

Packing is a family affair, as all of the relatives are brought into the packing house to do the various duties and are shifted about as one part of the work slows up or another gets ahead. General observations, however, in different packing houses indicated that packing was accomplished by having a small girl place the wrapped oranges in a case for two experienced women packers. To keep this unit busy required four wrappers, and six sorters and wipers, with a foreman, porter, nailer, roper and paper girl taking care of from two to four crews.

One crew will pack about 40 cases per day of eight hours, with a greater output with the larger sizes, of fruit. In a house having eighty people the output was about 300 cases per day. Thus the total packing house cost for labor amounts to about 1.6 pesetas (23¢) per case.

The cost for the wood in the case is about 2.5 pesetas  $(36\phi)$  each. Usually the cost of the case make up was given as 3 pesetas  $(43\phi)$ . The most common sources of wood were Spain, Portugal and Minorca Island. The wood is very commonly sawn by hand-saw on or near the premises.

All paper wraps are printed, very often with two colors. In one instance noted the packer had his own printing crew. The cost of paper was given as 0.51 pesetas  $(7.3\phi)$  per case.

Consolidating these figures and we find the approximate picking and packing costs during the 1924-25 season as follows:

		Por	Case.	
	Pesetas			Dollars
Picking	0.33			.048
Packing, labor	1.6			.23
Case	3.0			.43
Paper	0.51			.073
Total				0.781

With a difference of 1.56 pesetas (22¢) between this and the packer's estimated 7 pesetas (\$1.01), not more than enough is left to cover all of the other costs that fall upon the packer in getting the fruit from the tree to the ship.

### Transportation and Selling Costs.

The ocean freight costs cover taking the fruit from the lighters brought alongside the ships at the packers expense, to the placing it over the ship's side at the point of destination. Most of the Spanish oranges are transported in ships of from 1000 to 2000 tons, under common stowage, the captain keeping the hatches agen and ventilating the cargo as much of the way as the weather will allow. This freight cost is from 1s. 3d. (30¢) to 1s. 6d. (36¢) per box for most of the ports of Nerthern Europe.

The handling and selling costs are quire variable. Commissions range from 3% to 6% and inclusive handling costs are subject to special "spet" rates and rebates. The following figures are considered representative.

	Per Case	
	Storling	Dollars
Freight		•300
Commission, 3% of12s	0 4.3	.086
Port handlin charge	1 4	.324
Total	25.11.30.	0.71

# Summary.

	Per Case		
Cost of growing 5.5 Cost of picking, packing,	posetas \$ .8	30	
shipping to port 7	posetas 1.0	)1	
Cost of transporting and selling2s. Total		71	

Using for the cost of rowing the median of the brokers estimates of the price at which a grower begins to make a profit, that is, 21 shillings per thousand, the cost is as follows:

	Por Case		
Cost of growing, 21 pasetts	7 magatag	\$1.01	
(\$3.02) per M Cost of picking, packing,	7 pesetas	φ±•0±	
shipping to port	7 11	1.01	
Cost of transporting and selling	2s. 11.3d.	.71	
Total	lls. 3d.	\$2.73	

Note: Whenever the term "case" has been used the usual Spanish "half-case", weighing from 95 to 112 pounds gross, has been referred to.

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CF-12 -111-

### General Outlook for Spanish Competition in Europe.

Those in Spain who are in a position to have a general outlook of their industry are greatly concerned over what the future holds in store for the Spanish grower. One large factor stated that if Russia did not come back into the circle of purchasing nations in the next five years, very distressing years were ahead, as plantings have been make that promise a production greatly in excess of present outlets.

To the casual visitor about Valencia no large new plantings are to be seen that resemble what we have been accustomed to seeing in some sections of Florida and California. However, as one travels from Castellon to Murcia one comes to realize that a large number of trees have been planted within the past six or eight years. Most of the bearing trees are in reasonably good health. We may expect an increasing production, especially with the industry in its present prosperous state.

Even without fumigating, Spanish orange trees do not seem to be seriously threatened by insects and the fruit arrives in the market without much evidence of scale insects. At the present time growers are showing considerable interest in American methods of fumigating and this practice may be expected to become more common in the future.

The available land suitable for orange planting in southern Spain gives plenty of room for future expansion if the industry should experience a series of profitable years. Most of the growers already have additional land that could be planted to oranges, if orange growing became so profitable that they preferred to buy their forage crops instead of raising them.

There is not much to be seen in southern Spain that would lead to the conclusion that oranges are to be produced for shipment during summer months. South Africa promises to be our principal competitor in the orange markets of Northern Europe during the summer season.

At the present time there is a great waste in the Spanish orange industry, and there is not much evidence that points towards the widespread adoption of methods that might very readily eliminate much of this waste and make the industry more profitable to Spanish growers than it has been with existing methods. There is, however, the possibility of gradual adoption of better methods and when this is done Spanish competition will make European markets for American oranges more difficult to reach than they are at the present time.

EDWIN SMITH
Specialist in Foreign Marketing.

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